

**IN THE CLAIMS:**

Please cancel claims 3-4, without prejudice. This listing of claims replaces all prior versions and listings of claims in the application:

**Listing of Claims**

1. (Currently Amended): An isolated protein comprising ~~an~~ the amino acid sequence as set forth in SEQ ID NO: 2, ~~4, 6 or 8~~.

2. (Currently Amended): An isolated protein consisting of ~~an~~ the amino acid sequence as set forth in SEQ ID NO: 2, ~~4, 6 or 8~~.

3. (Canceled)

4. (Canceled)

5. (Withdrawn): An isolated nucleic acid comprising: (a) a DNA consisting of the nucleotide sequence as set forth in SEQ ID NO: 1, 3, 5 or 7; or, a complementary strand to (a).

6. (Withdrawn): An isolated nucleic acid, wherein the nucleic acid encodes a polypeptide comprising a DNA repair activity and hybridizes under stringent conditions with a nucleic acid comprising the nucleotide sequence as set forth in SEQ ID NO: 1, 3, 5 or 7, or, with a complementary strand thereto.

7. (Withdrawn): An isolated nucleic acid, wherein the nucleic acid encodes a polypeptide comprising a DNA repair activity and hybridizes under stringent conditions with a probe

prepared from a nucleic acid comprising all or a part of a nucleotide sequence as set forth in SEQ ID NO: 1, 3, 5 or 7, or from a complementary strand thereto.

8. (Withdrawn): The isolated nucleic acid, wherein the stringent conditions comprise a wash step comprising a wash in 0.2X SSC at a temperature of about 65°C for about 15 minutes.

9. (Withdrawn): A recombinant vector comprising a nucleic acid as set forth in claims 4, 5, 6 or 7.

10. (Withdrawn): A recombinant vector comprising a nucleic acid encoding a polypeptide as set forth in claims 1, 2 or 3.

11. (Withdrawn): A transformed cell comprising a recombinant vector as set forth in claim 9.

12. (Withdrawn): A transformed cell comprising the recombinant vector as set forth in claim 10.

13. (Withdrawn): A method of producing a DNA repair enzyme, comprising  
(a) culturing a transformed cell according to claim 11 or claim 12, and  
(b) recovering the DNA repair enzyme from the resultant culture, thereby producing a DNA repair enzyme.

14. (Withdrawn): A method of producing a DNA repair enzyme, comprising  
(a) culturing a transformed cell according to claim 11 or claim 12, and  
(b) recovering the DNA repair enzyme from the resultant culture, thereby producing a DNA repair enzyme.

15. (Withdrawn): A method of repairing a DNA for sequence errors or base mismatch errors, comprising carrying out a DNA synthesis reaction in the presence of a polypeptide as set forth in claims 1, 2 or 3.

16. (Withdrawn): A method of preventing erroneous synthesis of DNA sequences, comprising carrying out a DNA synthesis reaction in the presence of a polypeptide as set forth in claims 1, 2 or 3.

17. (Withdrawn): A DNA repair gene-disrupted cell obtained by transferring into a host cell a nucleic acid as set forth in claims 4, 5, 6 or 7.

18. (Withdrawn): The DNA repair gene-disrupted cell of claim 17, wherein a modification gene has been incorporated into the nucleic acid.

19. (Withdrawn): The DNA repair gene-disrupted cell of claim 18, wherein the modification gene comprises a marker gene.

20. (Withdrawn): The DNA repair gene-disrupted cell of claim 17, wherein the host is a bacterium.

21. (Withdrawn): The DNA repair gene-disrupted cell of claim 20, wherein the bacterium is a thermophilic bacterium.

22. (Withdrawn): The DNA repair gene-disrupted cell of claim 21, wherein the thermophilic bacterium is a bacterium of the genus *Thermus*.

23. (Withdrawn): The DNA repair gene-disrupted cell of claim 22, wherein the *thermophilic* bacterium is a *Thermus thermophilus*.

24. (Withdrawn): An array comprising a nucleic acid as set forth in SEQ ID NO: 1, 3, 5 or 7.

25. (Withdrawn): An array comprising a nucleic acid as set forth in claims 4, 5, 6 or 7.

26. (Withdrawn): A method of screening a composition for its ability to specifically bind to a DNA repair enzyme comprising:

(a) contacting the a DNA repair enzyme with the composition, wherein the DNA repair enzyme is a polypeptide encoded by a nucleic acid sequence as set forth in claims 4, 5, 6 or 7; and,

(b) determining if the composition specifically binds to the DNA repair enzyme.

27. (Withdrawn): A method for inhibiting the expression of a DNA repair enzyme encoding nucleic acid in a cell, the method comprising the following steps:

(a) providing a nucleic acid operably linked to a promoter that expresses an inhibitory sequence, wherein the inhibitory sequence comprises all or part of a nucleic acid sequence as set forth in claims 4, 5, 6 or 7 and is expressed in a form sufficient to inhibit expression of a DNA repair enzyme message; and,

(b) expressing the inhibitory nucleic acid in an amount sufficient to inhibit the expression of the DNA repair enzyme encoding nucleic acid in the cell.

28. (Withdrawn): The method of claim 27, wherein the inhibitory sequence comprises an antisense sequence.

29. (Withdrawn): The method of claim 27, wherein the inhibitory sequence comprises a ribozyme sequence.

30. (Withdrawn): A method of expressing a heterologous nucleic acid sequence in a cell comprising:

- a) transforming the cell with a heterologous nucleic acid operably linked to a promoter, wherein the heterologous nucleic acid comprises a nucleic acid sequence as set forth in claims 4, 5, 6 or 7; and,
- b) growing the cell under conditions where the heterologous nucleic acid sequence is expressed in the cell.

31. (Withdrawn): A method for detecting a nucleic acid in a nucleic acid -containing biological sample, the method comprising the following steps:

- (a) contacting the sample with a nucleic acid probe comprising a nucleic acid sequence as set forth in claims 4, 5, 6 or 7;
- (b) hybridizing the nucleic acid probe to the nucleic acid in the sample; and,
- (c) detecting hybridization of the nucleic acids.

32. (Currently Amended): An fusion protein comprising a first amino acid sequence as set forth in SEQ ID NO: 2, ~~4, 6 or 8, or a subsequence thereof~~, and a second heterologous sequence.

33. (Withdrawn): An isolated antibody specifically reactive with a polypeptide as set forth in claim 1, claim 2 or claim 3 or a polypeptide encoded by a nucleic acid as set forth in claim 4, claim 5, claim 6, or claim 7.

34. (Withdrawn): The antibody of claim 33, wherein the antibody is a monoclonal antibody.

35. (Withdrawn): A hybridoma cell comprising the monoclonal antibody of claim 34.

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(FA)

Please add the following new claims:

36. (New) An isolated protein encoded by a nucleic acid comprising the sequence as set forth in SEQ ID NO:1.

37. (New) An isolated protein encoded by a nucleic acid consisting of the sequence as set forth in SEQ ID NO:1.